Day 1 Exercises

A. Very simple exercises for real beginners in programming. Mainly to familiarize yourself with C#, compilation, and WriteLine instructions

1. Write a program that will print out your detail in the following format:
   Line 1: Name
   Line 2: Email

   Example:
   John Smith
   e0011223@u.nus.edu

2. Write a program that would request for your name and print a greeting like this:
   Good Morning John
   where John is the name you had input.

3. Write a program that takes an integer as input and prints the square of that number.

4. Write a program that takes a double precision number as input and prints the square of that number.

5. Write a program that takes a double precision number as input and prints the number with 2 decimal points in the output.
   Example:

Input	Output
100.1	100.10
0	0.00
3.232	3.23
4.555	4.56

Section B. Expressions and Math Library:

1. Write a program that takes a double precision number as input and prints the square root of the number.

Input	Output
0	0
25	5
3	1.732

2. Slight modification to above: Write a program that takes a double precision number as input and prints the square root of the number. The square root should be rounded to 3 decimal places.

Input	Output
0	0.000
25	5.000
3	1.732
300	17.321

3. The ABC Company pays its employees salary plus benefits. The benefits are calculated as a percentage of the salary. The company pays every employee 10% housing allowance and 3% transport allowance. Write a program that takes the salary as input and prints the total income (salary + housing allowance + transport allowance) as output. Format the output in currency format.

Input	Output
1000	$1,130.00
0	$0.00
2000	$2,260.00

4. Write a program that would convert temperature given in Centigrade scale to Fahrenheit – the number can be integer or real. To convert temperature in Centigrade (C) to Fahrenheit (F) use the formula:

$$F = 1.8 * C + 32$$

Input	Output
0	32
-100	-148
100	212

5. Write a program that would take as input the value of x and calculate & output the value of y using the formula:

$$y = 5x^2 - 4x + 3$$

Input	Output
0	3
-100	50403
100	49603

6. Write a program that reads the (x, y) coordinates of two points. Compute the distance between the two points using the formula:

$$\text{Distance} = \text{Square Root of } [(x_2 - x_1)^2 + (y_2 - y_1)^2]$$

X1	Y1	X2	Y2	Distance
0	0	0	0	0
0	0	10	10	14.142135623731
1	1	10	1	9

Note: A common question that arises is that how to get four inputs (two pairs of x and y) from the users all at once. At this moment, we haven't learned about string manipulation and therefore you should just ask for user input four times.

7. ABC Taxi Company has the following meter charges based on the kilometres travelled.

   Minimum fixed charge: $2.40
   In addition the fare would be computed at 40 cents per kilometer.

   E.g. If the distance traveled is 3.24 km then the total fare is 2.40 + 3.24 * 0.4

Input	Output
0	2.4
3.3	3.72
10.23	6.492

8. In the ABC Taxi Company problem above, print the output so that the fare is the output is printed always rounded to nearest 10 cents and printed to two decimal places.

Input	Output
0	2.40
3.3	3.70
10.23	6.50

9. In the ABC Taxi Company problem above, calculate the fare so that the fare is always rounded upwards to the nearest 10 cents. This is harder than the previous problem and requires your ingenuity

Input	Output
0	2.4
3.3	3.8
10.23	6.5

   Hint: You can move the decimal points by one place by multiplying or dividing a real number with 10

10. Consider the simple Geometric example of determining the area of a triangle, given the lengths of its three sides a, b and c.

    Use the formula: AREA = SQUAREROOT[s(s-a)(s-b)(s-c)]
    where s = (a+b+c) / 2

    Does your program always work? What is the condition when the program will not work and return a real number? Think about a condition to detect the situation where the area cannot be computed. Such scenario is given below:

A	B	C	Output
0	0	0	0
3	4	5	6
1	1	3	NaN